CLAIMS

What is claimed is:

1. An orienter for use in a drilling tool assembly, said orienter comprising:

means for connection to a drilling motor, said drilling motor including a drive shaft for transmitting rotary power;

a clutch mechanism constructed and arranged for transmitting rotary power from said drive shaft when actuated;

a rotatable housing including a bent portion surrounding said drive shaft;

a speed reduction system located between said clutch mechanism and said rotatable housing;

whereby when said clutch mechanism is actuated, rotary power from said drive shaft is transmitted through said clutch mechanism, through said speed reduction system, to rotate said rotatable housing.

2. The orienter as defined in Claim 1 further including means for rotating said bent portion to a predetermined position.

3. The orienter as defined in Claim 1, wherein said clutch mechanism is a mechanical clutch which transmits torque using physical contact of surfaces.

4. The system as defined in Claim 1, further including a means for transmitting information describing the clock face position of said rotatable housing.

5. The system as defined in Claim 1 further including a steering means within said rotatable housing.

6. A system for creating a subterranean borehole along a predetermined path, said system comprising:

a drilling tool assembly constructed and arranged for mounting to the end of a length of coiled tubing;

means for storing said coiled tubing and causing said coiled tubing to move through the borehole;

said drilling tool assembly including:

a drill motor constructed and arranged for mounting to the end of said coiled tubing;

a rotating drill bit constructed and arranged to receive rotational torque from a drive shaft connected to said drill motor, said drill motor producing torque in response to the flow of drilling fluid through said coiled tubing;

an orienter located between said drill motor and said rotating drill bit, said orienter having a rotatable housing constructed and arranged to enclose said drive shaft;

said rotatable housing including a fixed bend constructed and arranged to cause said rotating drill bit to create an arcuate borehole in a direction determined by the orientation of said fixed bend; and

said orienter being further constructed and arranged to orient said fixed bend in response to a signal transmitted from the earth's surface.

7. A downhole tool system for drilling a bore hole along a predetermined path through the earth comprising:

a bit for drilling the bore hole when rotated;

a hydraulically driven motor including a drive shaft for rotating the bit in response to hydraulic fluid being pumped through said motor;

an orienter located between said bit and said motor, said orienter including a rotatable housing with a fixed bend;

means for selectively transmitting torque from said drive shaft to said rotatable housing.

8. The downhole system as defined in Claim 7 wherein said rotatable housing includes:

an upper section adjacent to said motor on one side of said fixed bend;

a lower section adjacent to said bit on the opposite side of said fixed bend.

9. A method of drilling a bore hole along a predetermined path through the earth comprising the steps of:

progressively moving, by means of a continuous length of coilable tubing, a drilling tool assembly, said drilling tool assembly including a rotating drill bit, said rotating drill bit being positioned adjacent to an orienter including a rotatable housing with a fixed bend;

causing said rotatable housing with a fixed bend to rotate for forming a straight section of said borehole;

causing said rotatable housing to remain stationary for forming an arcuate portion of said borehole;

periodically determining the orientation of said fixed bend.

10. The method as defined in Claim 9 wherein said rotating drill bit is driven by a hydraulic motor using fluid pumped through said continuous length of coiled tubing.

11. The method as defined in Claim 9 wherein the orientation of said fixed bend is electrically sensed during drilling operations.

12. The method of claim 10 wherein said fixed bend portion of said rotatable housing is rotated to a predetermined position by said drilling motor.

13. A method for drilling a subterranean bore hole along a predetermined path through the earth comprising the steps of:

inserting a drilling tooling means through the earth's surface into the subterranean environment;

pumping fluid media to said drilling tooling means through a continuous length of tubing connected to said tooling means;

inserting communication means through said continuous length of tubing to said drilling tooling means;

dividing said drilling tooling means into a rotatable and non-rotatable section, said rotatable section of said drilling tooling means including:

a bit for forming the bore hole when rotated;

means for orienting said drilling tooling means, said means for orienting said drilling tooling means including a fixed bend for causing said bit to bore an arcuate bore hole in the direction determined by the position of said fixed bend;

said means for orienting said drilling tooling means further including means for selectively positioning said fixed bend in response to a signal transmitted from the earth's surface through said communications means, to guide said bit along the predetermined path;

said non-rotatable section of said drilling tooling means including a motor for rotating said bit.

14. The method as defined in Claim 13, wherein said means for orienting said drilling tooling means further including a clutch mechanism for providing torque to said rotatable section.

15. The method as defined in Claim 13 further including the step of transmitting the position of said drilling means to the earth's surface.